(No Model.)

J. WEIS.

ELECTRIC MOTOR.

No. 335,863. Patented Feb. 9, 1886.

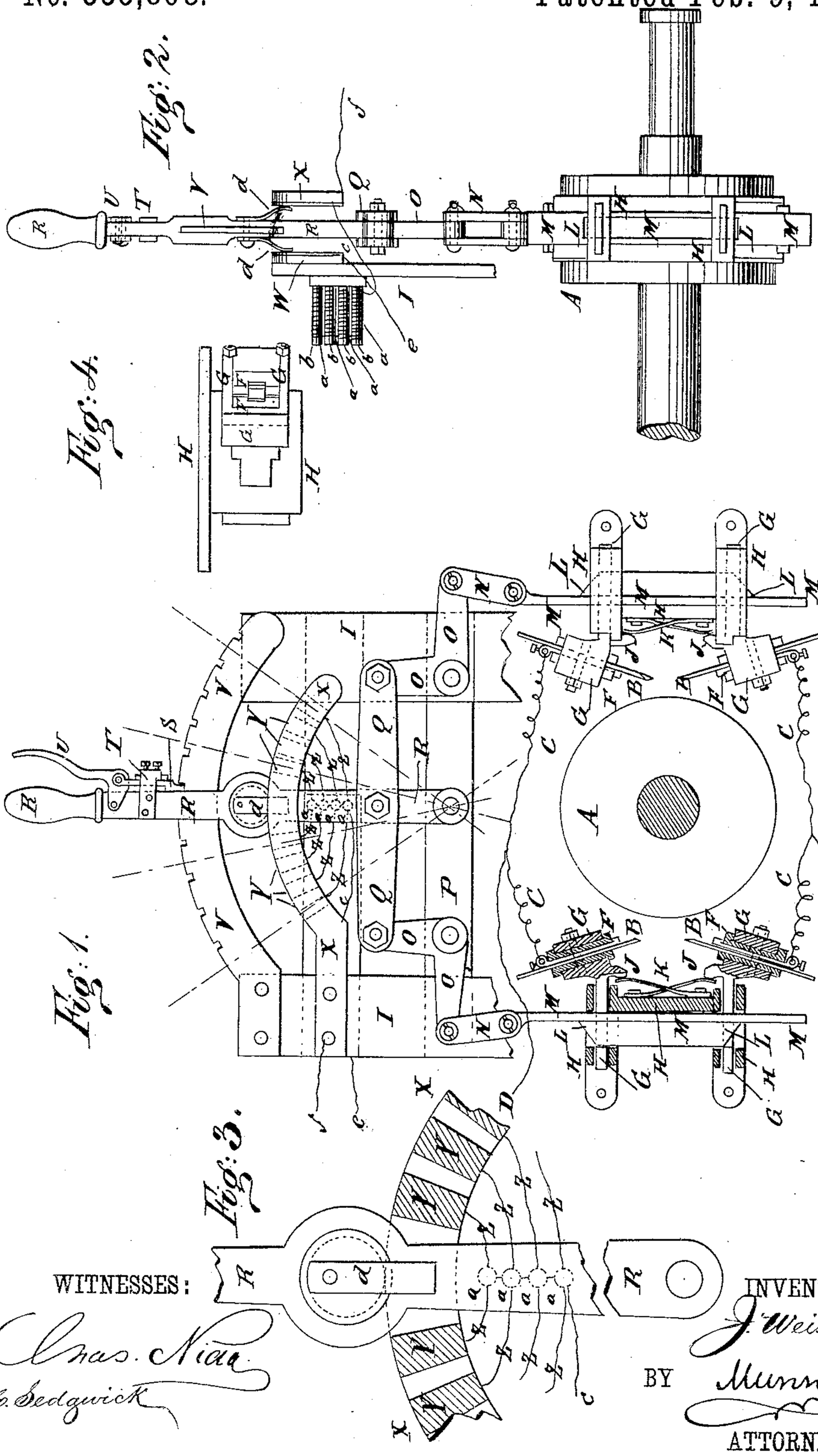

Fig: 2.

Fig: 4.

Fig: 1.

Fig: 3.

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JOSEPH WEIS, OF JERSEY CITY, NEW JERSEY.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 335,863, dated February 9, 1886.

Application filed May 22, 1885. Serial No. 166,336. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WEIS, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Electric Motors, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation, partly in section, of one of my improved electric motors. Fig. 2 is a rear elevation of the same and a part of the supporting-frame. Fig. 3 is a side elevation of a part of the power-regulating lever, enlarged, and showing a part of the sectional quadrant in section. Fig. 4 is a plan view of one of the brush-holders.

The object of this invention is to provide electric motors constructed in such a manner that the brushes can be readily adjusted to regulate the direction of the electric current, and that any desired amount of resistance can be thrown into the said current.

The invention consists in the construction and combination of various parts of an electric motor, as will be hereinafter fully described, and then pointed out in the claims.

A represents the commutator of an electric motor, and B are the brushes. The brushes B of the upper and lower pairs are connected by wires C, which are connected by the main wires D with a dynamo-electric machine in the ordinary manner. The brushes B are insulated by rubber gibs F, and are secured to holders G, which slide in a supporting-frame, H, secured to the frame I of the machine. Upon the inner sides of the holders G are formed lugs J, against which rest the ends of springs K, the other ends of the said springs being attached to the frame H, so that they will press the holders G forward, bringing the brushes B into working position when the said holders are released. The holders G are drawn back by inclined shoulders L, formed upon the upper and lower parts of the outer sides of the slides M, so that when the said slides are raised the lower brush-holders G may be pushed forward by the springs K, and the upper brush-holders G will be drawn back by the upper shoulders of the said slides M, and when the slides M are pushed down the lower brush-holders G will be drawn back and the upper holders pushed forward. The upper ends of the slides M are connected by links N with the lower arms of elbow-levers O, which are pivoted at their angles to a bar, P, of the machine-frame I. The upper arms of the elbow-levers O are pivoted to the ends of a bar, Q, which is pivoted at its center to the lever R at a little distance from its lower end. The lever R is pivoted at its lower end to the bar P or other suitable support, and is held in any position into which it may be adjusted by a pawl, S, working in a guard or keeper, T, attached to the upper part of the said lever, the said pawl being operated by a hand-lever, U, pivoted to the said lever R, and to the upper end of the said pawl S. The pawl S engages with recesses formed in the curved catch-bar V, attached to the frame I of the machine, or other suitable support. The lever R moves between an insulated metal quadrant, W, and an insulated quadrant, X, carrying contact-pieces Y. The ends of the quadrants W X are secured to the frame I of the machine. The contact-pieces Y of the quadrant X are connected by wires Z with the resistance-coils *a*, placed on insulated supports *b*, attached to the frame I. The resistance-coils *a* have different resistances, and are connected with each other, and the last or lowest coil is connected by a wire, *c*, with the quadrant X, so that when the lever R is brought into electric connection with any particular contact-piece Y the electric current will pass from the said contact-piece along its wire Z to the resistance-coil *a*, connected with the said contact-piece, through all the succeeding resistance-coils *a*, and through the wire *c* to the quadrant X. Connection is made between the quadrant W and the particular contact-piece Y of the quadrant X, opposite which the lever R may be adjusted, by contact-springs *d*, attached to and insulated from the said lever R, so that the operator, by adjusting the lever R, can introduce any desired amount of resistance into the motor-circuit.

e is the wire leading to the quadrant W, and *f* is the wire leading to the sectional quadrant X. The wires *e f* are connected with the generator, which is not shown in the drawings, and which may be a dynamo-machine or

any other electric generator. The wires D D are also connected with the generator at points where the fields and brushes of generator are connected; but the wires *e f* and D D are not connected with each other.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an electric motor, the combination, with the brush-holders G and their supporting-frames H, of the springs K, the slides M, having inclined shoulders L, and the slide-operating lever R, substantially as herein shown and described, whereby the brushes can be readily adjusted, as set forth.

2. In an electric motor, the combination, with the brush-operating lever R, of the metallic quadrant W, the contact-pieces Y, the graded resistance-coils *a*, and the contact-springs *d*, substantially as herein shown and described, whereby the electric current can be subjected to any desired amount of resistance, as set forth.

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Witnesses:
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